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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/308,166 | 06/25/1999 | Eric Leigh Mayes | HASLP003 | 5815 |
| 7590 | 03/05/2004 | | EXAMINER | |
| | | | RESAN, STEVAN A | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1773 | |
| DATE MAILED: 03/05/2004 | | | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|-----------------------------|------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 09/308,166 | MAYES ET AL. |
| | Examiner Stevan A. Resan | Art Unit 1773 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on ____.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 11-20,22 and 25-43 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
 5) Claim(s) ____ is/are allowed.
 6) Claim(s) 11-20,22 and 25-43 is/are rejected.
 7) Claim(s) ____ is/are objected to.
 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on ____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. ____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>See Text</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: ____ |

1. As a preliminary matter the examiner clarifies for the record that because of an error in referencing the Parent PCT case the initial listing of 32 claims in this application was in error, as well as the renumbering of the claims added in the first preliminary amendment. Therefore the first and second preliminary amendments were proper in numbering claims as beginning with claim 11.

2. Eight PTO 1449 papers were received on the following dates: 23 June 2000, 2 January 2001, 17 May 2001, 29 June 2001, 11 July 2001, 7 May 2002, 17 May 2002, 25 November 2002, signed and initialed copies are attached.

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 11-16, 25-35 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The amendment to the claims adding the phrase "substantially uniformly spaced apart" to claims 11 and 15 is considered new matter since it lacks support in the specification and claims as filed.(Note that the first preliminary amendment added claims 21 and 23 which first introduced the new matter but which are now canceled).

Claim 16 added by the first preliminary amendment contains the group member "micelles" which is considered new matter since it lacks support in the specification and claims as originally filed.

6. Claims 11-16, 25-35, 40 and 41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 11 and 15 are deemed indefinite since there is no definition or teaching in the specification of what "substantially uniformly spaced" means, how to attain this state, or measure it.

In addition the term "uniformly" in claims 11 and 15 is a relative term that renders the claim indefinite. The term "uniformly" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim 15 is also deemed indefinite since the coating is claimed as "surrounding each of said plurality of particles" while it appears that it surrounds each particle within the plurality of particles rather than the plurality itself.

Claims 12-14, and 16, 25-35 are rejected for depending from a claim rejected under 35 USC 112.

Claims 40 and 41 are essentially duplicates of claims 34 and 35.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 11-20, 22 and 25-43 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 9, 10, 12, 13, 18, 19, and 22-77 of copending Application No. 09/730117. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the 09/730117 application are encompassed by the present claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

10. Claims 11-20, 22, 25-28, 31-33, 36-39, 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blakemore US 4452896 in view of Mann US 5491219, Meldrum et al, and further Kitamoto US 4666773 and Nagayama US 5505996.

Blakemore discloses the forming of ferromagnetic/magnetizable particles in a protein molecule. The particles may be magnetite cubic particles with a length of each side 42-50 nm (Col 5 lines 51,59,66) and are single domain (Col 6 line67-Col 7 line 2). Blakemore teaches that the particles may be used in magnetic recording tape.(Col 8 line 6). Blakemore does not disclose that each of the particles had been formed in and is at least partially encased within a cavity of an organic macromolecule.

However, Mann and Meldrum et al teach forming ferromagnetic particles in apoferritin (Mann Col 1 lines 61-63). Mann indicates that the magnetoferitin produced has increased magnetic susceptibility (Col 7 lines 8-9). Meldrum teaches the use of apoferritin as a confined reaction environment (of a substantially uniform size and shape as in claims 28, 39) for the synthesis of nanometer size magnetic iron oxide of less than 100 nm as in claims 11,15,17, 22 and in the ranges of claims 26,27,32,33,37,38,(page 523 Col 2 lines 7-10), that the majority of the particles produced were discrete spherical nanometer sized crystals of uniform size (mean diameter 6 nm sigma=1.2 nm) and were discrete crystals within the apoferritin cavity (page 522 Col 3 lines 41-50.

Nagayama teaches the deposition of nanometer size particles onto a substrate to form an array (See example 1). The mixing of ferromagnetic particles in a coating comprising a solvent and coating on a substrate is old in the magnetic recording art as evidenced by Kitamoto et al (Col 7 lines 17-46) and is deemed to meet the present claim limitations. (Olli et al US 5766764 is cited as evidence that nanoscale magnetic particles are prevented from agglomerating when coated with a polymer as is done by Kitamoto et al).

Therefore, it would have been obvious to one of ordinary skill in the art to prepare ferromagnetic/magnetizable particles within an apoferritin cavity as taught by Meldrum in order to obtain uniform particles. Since the uniformity of magnetic particles is a results effective variable effecting magnetic recording performance it would have been obvious to one of ordinary skill in the art to further treat the particles with notorious size separation techniques to obtain further uniformity, as in claims 25, 31, 36, 42, if necessary, dependent upon the recording reproducing equipment employed.

It would also have been obvious to one of ordinary skill in the art to deposit the nanometer size magnetic particles as taught by Meldrum on a substrate to produce a magnetic recording medium (e.g. a tape) as suggested by Blackmore, using the established methods of Kitamoto et al or Nagayama.

11. Claims 15, 16, 31-35, 40-41 rejected under 35 U.S.C. 103(a) as being unpatentable over Nolan et al US 5965267 in view of Nagayama US 5505996.

Nolan discloses a magnetic recording medium having a plurality of magnetic metal particles of less than 100 nm diameter (See Col 8 lines 32-44 and figure 6) with a

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coating of carbon surrounding each particle deposited on a substrate. (See Figure 3, Claim 3). While Nolan does not disclose that the particles are uniformly spaced apart it appears from the prior art (See for example Olli previously cited) that coated particles would be uniformly spaced when coated from a solution.

Nagayama is added to the rejection for teaching a method for obtaining a two dimensional monolayer thin film and it would have been obvious to one of ordinary skill in the art to employ the method of Nagayama motivated by the desire to obtain a 2-D monolayer array motivated by the desire to minimize the magnetic layer thickness and make the thickness uniform.

The particles of Nolan et al and Nagayama are in the size ranges of claims 15, 32,33 and may be a magnetic metal or alloy as in claims 34,35,40,41 (a magnetic particle for magnetic recording would contain one or more of Co, Fe or Ni in order to be magnetic).

The particles of Nolan would inherently have a uniform cavity dimension (as in claim 31) since Fullerene carbon only forms in definite sizes. Notwithstanding well known separation methods may be performed when more uniformity is desired.

With respect to claim 16 the use of micelles and surfactants is old in the art for dispersion of metal particles as demonstrated by Wilcoxon US 5147841. It would have been obvious to one of ordinary skill in the art to add surfactant or use a micelle to stabilize colloidal size metal particles. as taught by Wilcoxon.

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lawton et al US 6350515 is cited for teaching Quantum dot composites

Margel et al US 6103379 is cited for teaching microspheres coated with magnetic material.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stevan A. Resan whose telephone number is 571-272-1513. The examiner can normally be reached on Tues-Thurs from 7:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau, can be reached at 571-272-1516. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



STEVAN A. RESAN
PRIMARY EXAMINER